7. (once amended) A method for controlling speed in a pulse-width-modulation-controlled motor powered by a load voltage, the load voltage supplied by a supply voltage, said method comprising the steps of:

diagnosing motor functionality using a difference between the supply voltage and the load voltage;

switching from motor functionality diagnosis to motor speed control; and

setting an average speed of the motor by superimposing sweep frequencies onto an average pulse-width frequency, the average pulse-width frequency being a predetermined average of the sweep frequencies.

17. (once amended) A method for operating a motor configured to operate at a variable average speed under pulse-width modulation control, said method comprising the steps of:

energizing the motor; and

setting an average speed by superimposing sweep frequencies onto an average pulse-width modulation frequency, the average pulse-width modulation frequency being a predetermined average of the sweep frequencies.

18. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform.

19. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by

superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform.

20. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency.

21. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform with a low value approximately 20% below the average and a high value approximately 20% above the average.

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22. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform with a low value approximately 20% below the average and a high value approximately 20% above the average.

23. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency with a low value approximately 20% below the average and a high value approximately 20% above the average.

24. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency

forming a monotonically increasing waveform with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

25. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

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26. (once amended) A method in accordance with Claim 17 wherein said step of setting an average speed further comprises the step of setting an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

27. (once amended) A motor comprising:

a housing;

a stator mounted in said housing, said stator comprising a stator bore;

a rotor rotatably mounted at least partially within said stator bore; and

a processor electrically connected to at least one of said stator and said rotor, said processor configured to:

determine a load voltage; and

set pulse-width modulation duty cycles based on the determined voltage, wherein an average of frequencies of the pulse-width modulation duty cycles is a predetermined average pulse-width modulation frequency of the motor.

28. (once amended) A motor in accordance with Claim 27 wherein said processor further configured to diagnose motor functionality.

29. (once amended) A motor in accordance with Claim 28 wherein said processor further configured to diagnose motor functionality by calculating power use in accordance with:

$$\frac{[(Upper\_A/D\_\mathrm{Re}ading)-(Lower\_A/D\_\mathrm{Re}ading)]^2}{Rsense}$$

where $Upper\_A/D\_Reading$ is a supply voltage measurement, $Lower\_A/D\_Reading$ is a load voltage measurement, and $Rsense$ is a resistance between measurement locations for $Upper\_A/D\_Reading$ *and* $Lower\_A/D\_Reading$.

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30. (once amended) A motor comprising:

a housing;

a stator mounted in said housing, said stator comprising a stator bore;

a rotor rotatably mounted at least partially within said stator bore; and

a processor electrically connected to at least one of said stator and said rotor, said processor configured to set an average speed by superimposing sweep frequencies onto an average pulse-width modulation frequency, wherein the average pulse-width modulation frequency is a predetermined average of the sweep frequencies.

31. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform.

32. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform.

33. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency.

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34. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform with a low value approximately 20% below the average and a high value approximately 20% above the average.

35. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform with a low value approximately 20% below the average and a high value approximately 20% above the average.

36. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency with a low value approximately 20% below the average and a high value approximately 20% above the average.

37. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

38. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

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39. (once amended) A motor in accordance with Claim 30 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

40. (once amended) A refrigerator comprising:

a housing;

a freezer section at least partially within said housing;

a fresh food section at least partially within said housing;

a motor at least partially within said housing; and

a processor electrically connected to said motor, said processor configured to set an average speed of the motor by superimposing sweep frequencies onto an average

pulse-width modulation frequency, wherein the average pulse-width modulation frequency is a predetermined average of the sweep frequencies.

41. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform.

42. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform.

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43. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency.

44. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform with a low value approximately 20% below the average and a high value approximately 20% above the average.

45. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform with a low value approximately 20% below the average and a high value approximately 20% above the average.

46. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency with a low value approximately 20% below the average and a high value approximately 20% above the average.

47. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically increasing waveform with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

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48. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a monotonically decreasing waveform with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

49. (once amended) A refrigerator in accordance with Claim 40 wherein said processor further configured to set an average speed by superimposing a sweep frequency range onto an average pulse-width modulation frequency forming a random waveform centered around the average pulse-width modulation frequency with a low value at least approximately 5% below the average and a high value at least approximately 5% above the average.

50. (once amended) A refrigerator comprising:

a housing;

a freezer section at least partially within said housing;

a fresh food section at least partially within said housing;

a motor at least partially within said housing; and

a processor electrically connected to said motor, said processor configured to:

determine a load voltage; and

set pulse-width modulation duty cycles based on the determined voltage, wherein an average of frequencies of the pulse-width modulation duty cycles is a predetermined average of pulse-width modulation frequency of the motor.

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51. (once amended) A refrigerator in accordance with Claim 50 wherein said processor further configured to diagnose motor functionality.

52. (once amended) A motor in accordance with Claim 51 wherein said processor further configured to diagnose motor functionality by calculating power use in accordance with:

$$\frac{[(Upper\_A/D\_\mathrm{Re}ading)-(Lower\_A/D\_\mathrm{Re}ading)]^2}{Rsense}$$

where $Upper\_A/D\_Reading$ is a supply voltage measurement, $Lower\_A/D\_Reading$ is a load voltage measurement, and $Rsense$ is a resistance between measurement locations for $Upper\_A/D\_Reading$ and $Lower\_A/D\_Reading$.

Remarks

The Office Action mailed February 21, 2003 has been carefully reviewed and the following remarks are made in consequence thereof. Submitted herewith are a Submission of